Appl. No. 09/822,709
Reply to Final Office Action of March 30, 2004

Docket No. EMC-005PUS

REMARKS/ARGUMENTS:

The above-identified patent application has been amended and Applicants respectfully request the Examiner to reconsider and again examine the claims as amended.

Applicants have filed herewith a Request for Continued Examination (RCE) under 37 C.F.R. §1.114 and Applicants respectfully request that this Amendment be entered in accordance with the provisions of 37 C.F.R. §1.114.

Claims 1-9 and 11-17 are pending in the application. Claims 1-9 and 11-16 are rejected. In the Office Action, the Examiner indicated that Claim 17 was allowed. Since Claim 17 corresponds to Claim 10 re-written in independent form, Applicant has cancelled Claim 10 without prejudice.

In accordance with the revised provisions of 37 C.F.R. §1.121(c) as enacted on July 30, 2003, a marked up version of the claims is provided hereinabove. Also attached are replacement sheets for the amended figures and sheets having markings to show changes made.

The Examiner rejects Claims 1, 6 and 12 under 35 U.S.C. §102(e) as being anticipated by Cabrera (U.S. Pat. No. 6,553,387).

Applicants submit that Claim 1 is patentably distinct over the cited reference since the reference neither describes nor suggests "... specifying one or more <u>collapsed extents</u> ... and recording the detail of the <u>collapsed extents</u>... " as set forth in Claim 1.

Applicants would like to remind the Examiner that to sustain a rejection under 35 U.S.C. §102(e), <u>a single reference must disclose each and every element of the claimed invention</u>. In this case, the Cabrera reference fails to describe a "collapsed extent" as called for in Claim 1.

In the Office Action dated March 30. 2004, on Page 2, paragraph 4a), the Examiner states:

> In response to applicant's arguments on page 7 with regard to "extent" and "collapsed extent," examiner would like to refer to page 2, lines 20-21 of specification "the sections of the disks are referred to as "extents" (.i.e. an extent corresponds to a small portion or piece of a disk)" or page 4, lines 28-29, "it is possible to treat each extent which is part of the stripe pattern on the disk as one large extent referred to herein as a collapsed extent" also page 5, lines 25-26 of specification "Each collapsed extent is based on a plurality of actual extents which define a file or block of data..." (emphasis supplied).

Applicants would first like to make clear that the above text refers to the specification of the instant application (i.e. the specification of U.S. Appl. No. 09/822,709. Next Applicants agree with the Examiner's statement- i.e. Applicants agree that a single "collapsed extent" as referred to in Applicants' claims represents a plurality of actual extents. Stated differently, a collapsed extent is a mechanism that allows multiple extents to be treated as one large extent (see, U.S. Appl. No.09/822,709 at page 4, lines 28-29).

The Examiner, however, then states:

> ... base [sic] on this definition, Cabrera's extent reads on the claim because: according to applicant's definition of extent (extent corresponds to a small portion of the disk), and each extent in Cabrera's reference points out to a small part of disk, and with regard to collapsed extent, applicant's states that "Each collapsed extent is based on a plurality of actual extents which define a file or block of data each", therefore, plurality of extents in Cabrera's reference is consider as one "collapsed extent". (emphasis supplied).

Thus, while the Examiner apparently concedes that Cabrera only describes conventional extents and that the "collapsed extent" referred to in Applicants' claims represents a plurality of conventional extents, the Examiner somehow concludes that the existence of conventional extents in Cabrera describes Applicants claimed "collapsed extents" which, as stated above, correspond to mechanism for referring to or designating multiple conventional extents as a single large extent.

As described in the specification of the instant application, a "collapsed extent" represents a list of conventional extents. Thus, the conventional extents (e.g. extents of the type described in Cabrera for example) can be represented in a very concise form by a collapsed extent. Use of a collapsed extent, therefore, enables the efficient transfer of extent information between different parts of a backup system.

Furthermore, in the case where the number of conventional extents needed to backup an object exceeds the number of extents which the backup system can handle, a backup operation can not be successfully completed. By using collapsed extents, however, such a backup operation can be completed.

In contrast, Cabrera merely describes an improvement to logical volume management software. In particular, Cabrera describes a technique for determining if some part of a logical volume is stale. Cabrera mentions "extents," because volume managers typically deal with extents, but there is no idea of collapsing the representation of extents for any purpose. Applicants would also like to point out that Cabrera does not mention backup or restore techniques. Thus, Cabrera is not concerned with the number of extents used to represent an object.

On Page 3 at paragraph 4c) of the Office Action dated March 30. 2004, the Examiner states:

> In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., logical volume management software, efficiency) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Guens*, 988 F.2d 1181, 26 USPQ2nd 1057 (Fed. Cir. 1993).

The Examiner's remark misses the point. Applicants have not argued that the patentability of claims 1, 6 and 12 relates in any way to logical volume management software.

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Also, Applicants have not or relied the words "logical volume management software" for patentability of the claims. It is unclear why the Examiner thinks this is Applicants position. Applicants merely point out that this is an area with which the Cabrera reference is concerned.

In the Office Action dated March 30. 2004, on Page 4, paragraph 6 the Examiner states:

> As per claims1, 6, 12 Cabrera teaches a method of backing up and restoring data in a computer system, the method comprising: defining a logical backup object (col. 1, lines 61); specifying one or more collapsed extents (col. 8, lines 25-27, fig. 2, disks 2, and 3) (where stripe or collapsed extents is comprising of plurality of extents); and recording details of the collapsed extents (col. 8, lines 33-38).

Applicants have carefully reviewed the Cabrera reference and Applicants submit that the phrase "collapsed extents" never appears in the Cabrera reference as apparently alluded to above by the Examiner. Furthermore, it is Applicants' position that Cabrera fails to describe or suggest anything which even remotely resembles a "collapsed extent."

In view of the above, Applicants submit that Claim 1 is patentably distinct over Cabrera.

Applicants submit that Claim 6 is patentably distinct over the cited reference since the reference neither describes not suggests a ..." method ... comprising ... discovering one or more actual extents on the primary storage system ... collapsing the extents ... and specifying the collapsed extents to the backup storage system ..." as called for in Claim 6.

Since Cabrera does not understand the makeup or the purpose of a "collapsed extent," it is not possible for Cabrera to describe discovering one or more actual extents on the primary storage system ... collapsing the extents ... and specifying the collapsed extents to the backup storage system ... as called for in Claim 6.

Likewise, Applicants submit that Claim 12 is patentably distinct over the cited reference since the reference neither describes not suggests a "... backup and restore system for backing up

and restoring files to and from a primary storage system coupled to a client, the backup and restore system comprising ... a processor for defining a logical backup object ... <u>a collapsed extent processor for specifying collapsed extents</u> ... means for starting data movement ... and <u>an extent recording processor for recording details of collapsed extents...</u>" as called for in Claim 12.

Also in the Office Action dated March 30. 2004, on Page 4, paragraph 6, the Examiner states:

> As per claim 12, Cabrera further teaches a collapsed extent processor for specifying collapsed extents (fig. 1, element 21); and extent processor for recording details of collapsed extents (fig. 1, element 21, the processor which do recording for extents, is responsible for collapsed extents, since collapsed extent is made of plurality of extents).

<u>Applicants have carefully reviewed the Cabrera reference and Applicants submit that Cabrera fails to describe an extent processor for recording details of collapsed extents as alluded to above by the Examiner.</u>

Furthermore, it is Applicants' position that Cabrera fails to describe or suggest anything which even remotely resembles an extent processor for recording details of collapsed extents.

The Examiner rejects Claims 2-5, 7-11 and 13-16 under 35 U.S.C. §103(a) as being unpatentable over Cabrera (U.S. Patent No. 6,553,387) in view of West (U.S. Patent No. 6,446,175). The Examiner stated:

Cabrera is discussed above. The West Patent deals with a special configuration of backup, where the data is copied from one array to another in the form of a snapshot, and then copied to tape. There is no mention of extents or volume managers (although the word volume as in disk volume or tape volume occurs frequently). Moreover, West neither describes nor suggests collapsing of extents for efficiency or any other purpose.

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Each of Claims 2-5 depend, either directly or indirectly, from base claim 1 which recites a method of backing up and restoring data in a computer system, the method comprising "... specifying one or more <u>collapsed extents</u> ... and recording the detail of the <u>collapsed extents</u>...."

Applicants thus submit that claims 2-5 are each patentably distinct over the cited references whether taken separately or in combination since the references neither describe nor suggest specifying one or more <u>collapsed extents</u> ... and recording the detail of the <u>collapsed extents</u> as called for in each of Claims 2-5.

Each of Claims 7-11 depend, either directly or indirectly, from base claim 6 which recites a method of backing up data used in a computer system having a client, a primary storage system and a backup storage system, the method comprising "... discovering one or more actual extents on the primary storage system ... <u>collapsing the extents</u> ... and <u>specifying the collapsed extents</u> to the backup storage system...."

Applicants thus submit that each of claims 7-11 are each patentably distinct over the cited references whether taken separately or in combination since the references neither describe nor suggest ... discovering one or more actual extents on the primary storage system ... <u>collapsing the extents</u> ... and <u>specifying the collapsed extents</u> to the backup storage system... as called for in each of Claims 7-11.

Each of Claims 13-16 depend, either directly or indirectly, from base Claim 12 which recites a "... backup and restore system for backing up and restoring files to and from a primary storage system coupled to a client, the backup and restore system comprising ... a processor for defining a logical backup object ... <u>a collapsed extent processor for specifying collapsed extents</u> ... means for starting data movement ... and <u>an extent recording processor for recording details of collapsed extents</u>...."

Applicants thus submit that each of claims 13-16 are patentably distinct over the cited references whether taken separately or in combination since the references neither describe nor suggest ... discovering one or more actual extents on the primary storage system ... <u>collapsing</u>

the extents ... and specifying the collapsed extents to the backup storage system... as called for in each of Claims 13-16.

In view of the above, Applicants submit that the rejection of Claims 2-5, 7-11 and 13-16 under 35 U.S.C. §103(a) should be removed.

In the Office Action, the Examiner indicated that Claim 10 would be allowable if amended to include the limitations of the base claims and any intervening claims. Applicants have added new independent Claim 17 which corresponds to Claim 10 re-written in independent form including the limitations of base Claim 8. Thus, Applicants submit that Claim 17 is allowable.

In view of the above remarks, Applicants submit that Claims 1-9 and 11- 17 and the entire case are now in condition for allowance and should be sent to issue and such action is respectfully requested.

The Examiner is respectfully invited to telephone the undersigning attorney if there are any questions regarding this Amendment or this application.

The Assistant Commissioner is hereby authorized to charge payment of any additional fees associated with this communication or credit any overpayment to Deposit Account No. 500845.

Respectfully submitted,

Dated: ___9/30/04___

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